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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,843	03/30/2001	Samir Kumar Brahmachari	Q63915	7045

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SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, DC 20037-3213

EXAMINER
SMITH, CAROLYN L

ART UNIT	PAPER NUMBER
1631	

DATE MAILED: 12/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/820,843	BRAHMACHARI ET AL.	
	Examiner	Art Unit	
	Carolyn L Smith	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *17-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-19* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicants' election without traverse of Group I (claims 1-16) and a specie election of A (*Borrelia burgdorferi*) in Paper No. 9, filed 10/17/02, is acknowledged.

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR § 1.821 (a)(1) and (a)(2). See for example, page 17, line 13 and elsewhere. However, this application fails to comply with the requirements of 37 CFR § 1.821 through 1.825, because it lacks SEQ ID Nos cited along with each sequence in the specification. Applicants are also reminded that a CD-ROM sequence listing submission may replace the paper and computer readable form sequence listing copies. Applicant(s) are required to submit a new computer readable form sequence listing, a paper copy, or CD-ROM for the specification, statements under 37 CFR § 1.821 (f) and (g). Applicant(s) are given the same response time regarding this failure to comply as that set forth to respond to this office action. Failure to respond to this requirement may result in abandonment of the instant application or a notice of a failure to fully respond to this Office Action.

Claims herein under examination are claims 1-16.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code, such as on page 2, line 4, and elsewhere. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

The specification is objected to because of the following informalities:

(a) the use of abbreviations without the full name mentioned at the abbreviations' first occurences, such as the organisms listed on page 8, line 20 and page 9, lines 1-2.

(b) "B. burgdorfei" is misspelled on page 9, line 20, and elsewhere.

(c) "amonoacid" is misspelled on page 24, line 10.

(d) "There fore" is misspelled on page 24, lines 12, 18-19, and elsewhere.

Correction of these and other spelling mistakes is required.

Claim Objections

Claims 1-4, 7, and 9-16 are objected to because of the following informalities:

Claim 1: The improper use of periods at the end of each phrase in claim 1 on lines 4, 6, 8, 10, and 11 as well as the misplaced period on line 14. Correction is suggested by replacing the periods with commas and adding the word "and" at the end of the phrase on line 12, as well as removing the period after the word "pathogen" on line 4.

Claim 2: The organism "B. burgdorfei" is misspelled on line 2 of claim 2.

As the word "data" is a plural word, "is" on line 1 should be replaced with its plural form.

The claim is grammatically incorrect without the word "and" inserted before "V. cholerae" on line 4 of claim 2.

Claim 3: The word "co9mprising" is misspelled on line 2 of claim 3.

Claim 4: Spaces are missing between the words "claim," "1," and "wherein on line 1 of claim 4.

Claim 7: Steps "I" should be typed in a lower case letter on line 1 of claim 7.

Claim 9: As written, the claim is not a sentence as it is missing a verb. Correction is suggested by adding a verb, such as "are," after the word "sequences" on line 1 of claim 9. The word "methos" is misspelled on line 1 of claim 9. The organism "B. burgdorfei" is misspelled on line 3 of claim 9. Claim 9 is grammatically incorrect without the word "and" inserted before "V. cholerae" on line 5 of claim 9.

Claim 10: The word "list" should be capitalized on line 3 of claim 10. As written, the claim is not a grammatically correct sentence. Correction is suggested by adding a verb, such as "are," after the word "sequences" on line 1 of claim 10.

Claim 11: The word "The" should not be capitalized on line 1 of claim 11. As written, the claim is not a grammatically correct sentence. Correction is suggested by adding a verb, such as "are," after the word "candidates" on line 2 of claim 11.

Claim 12: As written, the claim is not a grammatically correct sentence. Correction is suggested by adding a verb, such as "are," after the word "proteins" on line 1 of claim 12.

Claim 13: As written, the claim is not a grammatically correct sentence. For example, correction is suggested by placing "by" on line 3 of claim 13 before "using" as well as replacing the semicolon on line 5 of the claim with a comma.

Claims 14-16: As written, the claims are not grammatically correct sentences. Correction is suggested by adding a verb, such as "are" after the word "sequences" on line 2 of each respective claim.

Claim 16: The word "The" should not be capitalized on line 1 of claim 16.

Appropriate correction is required.

PATENTABLE UTILITY GUIDELINES

The pending claims have been reviewed in light of the Utility Examination Guidelines and Guidelines for Examination of Patent Applications under 35 U.S.C. 112, first paragraph, "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1092-1111, Friday, January 5, 2001.

The examiner is using the following definitions in evaluating the claims for utility.

"Specific" - A utility that is *specific* to the subject matter claimed. This contrasts with a *general* utility that would be applicable to the broad class of the invention.

"Substantial" - A utility that defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities.

"Credible" - Credibility is assessed from the perspective of one of ordinary skill in the art in view of the disclosure and any other evidence of record that is probative of the applicant's assertions. That is, the assertion is an inherently unbelievable undertaking or involves implausible scientific principles.

"Well-established" - a specific, substantial, and credible utility which is well known, immediately apparent, or implied by the specification's disclosure of the properties of a material, alone or taken with the knowledge of one skilled in the art.

Claims Rejected Under 35 U.S.C. § 101

35 U.S.C. § 101 reads as follows:

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

Claims 1-16 are rejected under 35 U.S.C. § 101 because the claimed invention lacks patentable utility due to its not being supported by a specific, substantial, and credible utility or, in the alternative, a well-established utility.

These claims pertain to a "method for identifying the candidate proteins useful as anti-infectives" as stated in claim 1. The claimed method detects outlier proteins using cluster analysis and evaluation of several variable and fixed protein attributes but it falls short of a readily available utility of providing how these proteins may be anti-infectives. Many proteins could serve as anti-infectives and this method appears to be applicable to identifying outlier proteins, but not necessarily anti-infective candidates.

Furthermore, the claimed method is not supported by a substantial utility because no substantial utility has been established for the claimed subject matter. Applicants state on page 1, lines 8-10, the identification of outlier proteins in pathogenic organisms "are either virulence proteins or antigens or used as drug targets." Claims 14, 15, and 16 state the hypothetical protein sequences can be used for diagnostic purposes, vaccine candidates, and therapeutic purposes. However, further research would be required to identify or confirm a "real world" context of use of this method, as the validation in statements that the proteins being associated as anti-infectives and other potential purposes is unknown. Merely identifying the outlier proteins and claiming them as anti-infective candidates does not define a "real world" context of use. Similarly, other listed or asserted utilities as summarized above or in the instant specification are neither substantial nor specific due to being generic in nature and applicable to many such proteins.

Applicant should explicitly identify a specific, substantial, and credible utility for the claimed invention and establish a probative relation between any evidence of record and the originally disclosed properties of the claimed invention.

It is noted that applicants intend to validate the protein sequences as anti-infectives by comparing them with known protein sequences as stated in step (vi) of claim 1. Absent factual evidence, one skilled in the art would have reason to doubt that

sequence similarity alone would reasonably support the assertion that the biological activity of the claimed subject matter would be the same as that of the similar sequence. Furthermore, it is unclear whether the similar sequence identified in the prior art has actually been tested for the biological activity or whether this also is an asserted biological activity based upon sequence similarity to yet a different sequence. Note that it would have been well known in the art that sequence similarity does not reliably correlate to structural similarity and that structural similarity does not reliably result in similar or identical biological activities. For example, it would have been well known that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in many instances, albeit not in all cases. In the absence of factual evidence characterizing the structural and functional components of the biomolecule, the effects of these changes are largely unpredictable as to which ones will have a significant effect and which ones will be silent mutations having no effect. Several publications document the unpredictability of the relationship between sequence, structure, and function, although it is acknowledged that certain specific sequences have been found to be conserved in biomolecules having related function following a significant amount of further research. See Lopez et al. (Molecular Biology, 32:881-891,1999); Attwood (Science, 290:471-473, 2000); Gerhold et al. (BioEssays, 18(12):973-981, 1996); Wells et al. (Journal of Leukocyte Biology, 61(5):545-550, 1997); and Russell et al. (Journal of Molecular Biology, 244:332-350, 1994). However, this level of factual evidence is absent here.

Claims Rejected Under U.S.C. § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized in Ex parte Forman, 230 USPQ 546 (BPAI 1986) and reiterated by the Court of Appeals in In re Wands, 8 USPQ2d 1400 at 1404 (CAFC 1988). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. The Board also stated that although the level of skill in molecular biology is high, the results of experiments in genetic engineering are unpredictable. While all of these factors are considered, a sufficient amount for a *prima facie* case are discussed below.

LACK OF ENABLEMENT

Claims 1-16 are rejected under 35 U.S.C. § 112, first paragraph as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the claimed sequence. For the identification of a protein sequence putatively assigned a biological function, even if correct, does not appear to be defined as to what use it is to be applied to. The significance of the candidate is undefined, further rendering it indiscernible how someone of skill in the art would use such an entity.

Due to the large quantity of experimentation necessary to determine activity or property of an anti-infective as well as their potential usefulness for diagnostic or therapeutic purposes, such that it can be determined how to use the method and candidate, the lack of direction/guidance presented in the specification regarding the same, the absence of working examples directed to the same, and the breadth of the claims which fail to recite particular biological activities, the specification fails to teach the skilled artisan how to make and use the claimed invention.

Also, since the claimed invention is not supported by a specific, substantial, and credible utility or a well-established utility for the reasons set forth above (refer to 35 U.S.C. § 101 rejection), one skilled in the art would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is vague and indefinite as it is unclear how the claimed method involving finding protein outliers computationally validates the protein sequences as anti-infectives when no method step mentioned seems to support this declaration. Claims 2-16 are also rejected due to their dependency from claim 1.

Claims 2 and 9 contain embodiments which are beyond the elected invention. Correction is suggested by stating only the embodiments which are part of the invention.

Claims 2 and 9 are vague and indefinite due to the unclarity of citing an abbreviation, such as "B" in "B. burgdorfei" on lines 2 and 3 of each claim, respectively. Correction is suggested by amending in of the full name in parentheses.

Claims 11 and 14-16 recite the word "hypothetical" which is vague and indefinite. It is unclear why the unique outlier protein is considered hypothetical. As described, the proteins identified either are unique outlier proteins or are not unique outlier proteins. As the context for the word "hypothetical" is unclear, clarification of this wording is required.

Claim 13 is vague and indefinite due to the unclarity of citing an abbreviation, such as "CPU" on line 4 of the claim. Correction is suggested by amending in of the full name in parentheses or citing "CPU" alongside "central processing unit" when it is first mentioned on line 2 of the claim.

Conclusion

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and

1157 OG 94 (December 28, 1993) (See 37 CFR §1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carolyn Smith, whose telephone number is (703) 308-6043. The examiner can normally be reached Monday through Friday from 8 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached on (703) 308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instruments Examiner Tina Plunkett whose telephone number is (703) 305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

December 16, 2002

Ardin H. Marschel

ARDIN H. MARSCHEL
PRIMARY EXAMINER